CLAIMS

1. A method of performing computing operations, comprising:

associating a thermal threshold with a plurality of processing devices;

providing operations to at least some of the processing devices, a first one of the plurality of processing devices being operable to execute a first one of the operations; and

if the first processing device exceeds its thermal threshold during execution of the first operation, transferring the first operation to a second one of the plurality of processing devices.

2. The method of claim 1, wherein the second one of the plurality of processing devices is operable to execute a second one of the operations, the method further comprising transferring the second operation to the first processing device.

3. The method of claim 2, further comprising the first processing device executing the second operation at a reduced clock speed.

4. The method of claim 3, further comprising the second processing device executing the first operation at a standard clock speed.

5. A method of performing computing operations, comprising:

associating a thermal threshold with a plurality of processing devices;

providing operations to at least some of the processing devices, a first one of the plurality of processing devices being operable to execute a first one of the operations; and

if the first processing device exceeds its thermal threshold during execution of the first operation, transferring the first operation to a queue.

6. The method of claim 5, wherein the queue is a first queue or a second queue, the method further comprising:

associating a thermal attribute with the first operation; and

transferring the first operation includes sending the first operation to the first queue or the second queue depending upon the thermal attribute.

7. The method of claim 6, further comprising determining the thermal attribute based on an amount of heat expected to be generated by a chosen one of the processing devices if the chosen processing device is selected to perform the first operation.

8. The method of claim 6, wherein the first queue comprises a plurality of first queues, the second queue comprises a plurality of second queues, the first and second queues each have a priority associated therewith, the first operation has an execution priority associated therewith, and transferring the first operation further includes sending the first operation to a selected one of the first queues or to a selected one of the second queues depending upon the execution priority and the priorities of the first and second queues.

9. A processing system, comprising:

a first processor operable to execute operations, a first thermal threshold being associated with the first processor; and

a second processor operable to execute the operations, a second thermal threshold being associated with the second processor;

wherein, if the first thermal threshold of the first processor is exceeded during execution of a first

operation, the first operation is transferred to the second processor.

10. The processing system of claim 9, further comprising:

a queue;

wherein if the second processor is executing a second operation while the first thermal threshold is exceeded, the second processor is operable to transfer the second operation to the queue or to the first processor.

11. The processing system of claim 10, wherein the queue is one of a plurality of priority queues.

12. The processing system of claim 10, wherein the queue is a first queue or a second queue.

13. A processing system, comprising:

a first processor operable to execute a first operation, the first operation having a high priority, and a first thermal threshold being associated with the first processor; and

a second processor operable to execute a second operation, the second operation having a low priority, a second thermal threshold being associated with the second processor; wherein

if the first thermal threshold of the first processor is exceeded during execution of a first operation, the first operation is transferred to the second processor, the second operation is transferred to the first processor, and the first processor executes the second operation at a reduced clock speed.

14. A method of processing operations in a component executing the operations at a clock speed, the method comprising:

providing operations having lower or higher priorities of execution;

determining a thermal value indicative of the temperature of the component;

depending on the thermal value:

lowering the clock speed and selecting one of the operations having a lower priority of execution, or

maintaining or raising the clock speed and selecting one of the operations having a higher priority of execution; and

processing the selected operation.

15. A processing system for processing operations associated with thermal attributes, comprising:

a first operation having a first thermal attribute exceeding an operating threshold;

a second operation having a second thermal attribute not exceeding the operating threshold; and

a processor for executing the first and second operations, the processor having a thermal threshold;

wherein, if the thermal threshold of the processor is not exceeded, the processor selects the first operation for processing, and

if the thermal threshold of the processor is exceeded, the processor selects the second operation for processing.

16. The system of claim 15, wherein, if the thermal threshold is not exceeded, and if the first operation is not available, then the processor is operable to obtain and execute the second operation.

17. The system of claim 16, wherein, if the second operation is not available, then the processor is operable to idle for a predetermined period of time.

18. The system of claim 15, further comprising:

a plurality of priority queues, each of the priority queues including a first queue and a second queue,

the first queues for storing the first operation and the second queues for storing the second operation.

19. The system of claim 18, wherein a first one of the priority queues is a high priority queue, a second one of the priority queues is a medium priority queue, and a third one of the priority queues is a low priority queue.

20. A processing apparatus for processing operations, comprising:

a memory for storing a first operation; and

a plurality of processing devices operable to execute the first operation, a first one of the processing devices comprising a processing element, a processing unit or a sub-processing unit, the first processing device having a thermal threshold and access to the memory;

wherein, if the thermal threshold of the first processing device is exceeded during execution of the first operation, the first operation is transferred to a second one of the processing devices.

21. The processing apparatus of claim 20, wherein at least some of the processing devices are processing elements.

22. The processing apparatus of claim 21, wherein at least some of the processing elements further comprise at least one sub-processing unit.

23. The processing apparatus of claim 22, wherein each sub-processing unit includes a floating point unit, an integer unit and a register associated with the floating point unit and the integer unit.

24. The processing apparatus of claim 23, wherein each sub-processing unit further includes a local store.

25. The processing apparatus of claim 21, wherein at least some of the processing elements further comprise a processing unit and a plurality of sub-processing units associated with the processing unit.

26. The processing apparatus of claim 25, wherein the sub-processing units each further include a local store.

27. The processing apparatus of claim 20, wherein the first processing device includes the sub-processing unit, and the memory comprises a local store in the sub-processing unit.

28. The processing apparatus of claim 27, wherein:

the local store includes a queue for managing the operations; and

if the second processing device is executing a second operation while the thermal threshold of the first processing device is exceeded, the second processing device is operable to transfer the second operation to the queue or to the first processing device.

29. The processing apparatus of claim 28, wherein the queue is one of a plurality of priority queues.

30. The processing apparatus of claim 28, wherein the queue comprises a first queue for managing the first operation and a second queue for managing the second operation.

31. The processing apparatus of claim 20, wherein:

the memory comprises a first memory for storing the first operation and a second memory for storing a second operation;

at least some of the processing devices have access to the first and the second memories; and

if the second processing device is executing the second operation while the thermal threshold of the first processing device is exceeded, the second processing device is operable to transfer the second operation to the second memory or to the first processing device.

32. The processing apparatus of claim 20, wherein the first operation and a second operation are maintained in the memory at the same time.

33. The processing apparatus of claim 20, wherein the first operation and a second operation are maintained in the memory in a timesharing arrangement.

34. A processing apparatus for processing operations, comprising:

first and second memories for storing first and second operations; and

a plurality of processing devices operable to execute the first and second operations, a first one of the processing devices comprising a processing element, a processing unit or a sub-processing unit, the first processing device having a thermal threshold and access to the first and second memories;

wherein, if the thermal threshold of the first processing device is exceeded during execution of the first operation, the first operation is transferred to a second one of the processing devices.

35. A processing apparatus for processing operations, comprising:

a plurality of processing devices operable to execute operations, first and second ones of the processing devices each comprising a processing element, a processing unit or a sub-processing unit, the first processing device having a first thermal threshold, the second processing device having a second thermal threshold, a first one of the operations having a first priority, and second one of the operations having a second priority;

wherein, if the first thermal threshold of the first processing device is exceeded during execution of the first operation, the first operation is transferred to the second processing device, the second operation is transferred to the first processing device, and the first processing device executes the second operation at a reduced clock speed.

36. The processing apparatus of claim 35, wherein the first priority is a high priority and the second priority is a low priority.

37. A processing apparatus for processing operations, comprising:

a first operation having a first thermal attribute not meeting a condition;

a second operation having a second thermal attribute meeting the condition; and

a processor for executing the first and second operations, the processor comprising a processing element, a processing unit or a sub-processing unit and having a thermal threshold;

wherein, if the thermal threshold of the processor is not exceeded, the processor selects the first operation for processing, and

if the thermal threshold of the processor is exceeded, the processor selects the second operation for processing.

38. The processing apparatus of claim 37, wherein, if the thermal threshold is not exceeded, and if the first operation is not available, then the processor is operable to obtain and execute the second operation.

39. The processing apparatus of claim 38, wherein, if the second operation is not available, then the processor is operable to idle for a predetermined period of time.

40. The processing apparatus of claim 37, further comprising a plurality of priority queues, each of the priority queues including a first queue and a second queue, the first queues for storing the first operation and the second queues for storing the second operation.

41. The processing apparatus of claim 40, wherein a first one of the priority queues is a high priority queue, a second one of the priority queues is a medium priority queue,

and a third one of the priority queues is a low priority queue.

42. The processing apparatus of claim 37, wherein the processor comprises the sub-processing unit, and the sub-processing unit includes a floating point unit, an integer unit and a register associated with the floating point unit and the integer unit.

43. The processing apparatus of claim 42, wherein the sub-processing unit further includes a local store.